

ELECTRICAL CONTACT CONSTRUCTION

BACKGROUND OF THE INVENTION

The electrical contact construction as embodied in the subject invention is of the type as illustrated and described in applicant's prior issued U.S. Pat. No. 3,435,168.

In the aforesaid U.S. Pat. No. 3,435,168, an electrical contact is disclosed that is of the plunger-type and that is generally for use in testing of printed circuit boards on test fixtures. Although not disclosed in the prior mentioned patent, the spring-loaded test probes as shown and described in the patent are mounted in a test fixture and a plurality of corresponding contacts are located in an array on a printed circuit board under test. When the board is placed in the test fixture, electrical contact is made between the contacts which define the test probes and the circuit of the printed circuit board for purposes of carrying out the testing procedure.

As shown in U.S. Pat. No. 3,435,168, the electrical contact illustrated and described therein generally includes an elongated tubular member in which a plunger is located, the plunger being disposed outwardly in a biased position by a contact spring. A ball member is also located within the tubular member and cooperates with the spring to normally urge the plunger outwardly of the tubular member. In order to prevent the plunger from being expelled from the tubular member under pressure of the spring, a plurality of indentations or dimples are formed in the tubular member and are engageable by an enlarged portion of the plunger. Although the dimples were not disclosed in the prior known construction as having sharp inner corners, the dimples were formed such that the inwardly directed projections produced by the dimples were generally semi-spherical and only point contact was made by engagement of the plunger portion therewith. This sometimes resulted in the plunger member riding over the dimples and becoming lodged or wedged therebetween and the wall of the tubular member, thereby preventing the contact from operating effectively during tests. Even the bevel as formed on the end of the plunger member was not always effective in preventing the plunger from becoming snared or wedged on one of the dimple projections as formed in the wall of the tubular member.

In some instances and in particular when the diameter of the tubular member was relatively large, an annular ring was formed in the tubular member for defining the plunger stop. Such a ring defined a continuous shoulder which was effective for receiving the plunger portion thereagainst. However, the formation of the annular ring sometimes weakened the wall of the tubular members which on occasion caused the tubular member to snap apart during use.

It is the purpose of the subject invention to avoid the attendant difficulties as experienced in the so-called retaining means of the electrical contact as disclosed in the aforesaid U.S. Pat. No. 3,435,168 and as further discussed above and to provide an effective but inexpensive stop for the contact plunger.

SUMMARY OF THE INVENTION

The electrical contact construction as embodied in the subject invention comprises an elongated tubular body portion that is formed of a metal material and that is open at one end for receiving a metallic plunger in

sliding relation therein. The metallic plunger has an enlarged portion formed on the inner end thereof, a contact portion being formed on the exterior end of the plunger for engagement with an exteriorly located contact. A spring is located in the bore of the body portion and is operative to normally urge the plunger in an outwardly direction so that the contact portion is exposed for engagement with a corresponding contact when the device is used for test purposes. In order to prevent the plunger from being "hung-up" within the plunger body and thereby hindering the test procedure in which the contact is utilized, retaining means are formed in the body portion for engagement with the contact plunger, thereby preventing the plunger from sliding outwardly of the body portion. The retaining means include a plurality of spaced inwardly directed projections, the longitudinal dimension of which is greater than the lateral dimension thereof.

By forming the projections such that they are longer than they are wide, an effective area of contact for the interior plunger is provided, yet the elongated projections prevent the plunger edges from becoming jammed thereagainst, and thereby effectively retain the plunger within the tubular body portion as required.

Accordingly, it is an object of the present invention to provide an electrical contact construction having a tubular body portion in which a contact plunger is located, retaining means being formed in the tubular body portion and being shaped such that the longitudinal dimension thereof is greater than the lateral dimension thereof, wherein the plunger is prevented from being wedged within the tubular body portion during use of the contact construction.

Other objects, features and advantages of the invention shall become apparent as the description thereof proceeds when considered in connection with the accompanying illustrative drawing.

DESCRIPTION OF THE DRAWING

In the drawing which illustrates the best mode presently contemplated for carrying out the present invention;

FIG. 1 is a sectional view of the electrical contact construction as embodied in the present invention;

FIG. 2 is an enlarged fragmentary elevational view of a portion of the electrical contact construction showing the retaining means as formed therein;

FIG. 3 is a sectional view taken along line 3—3 in FIG. 2; and

FIG. 4 is a sectional view taken along line 4—4 in FIG. 3.

DESCRIPTION OF THE INVENTION

Referring now to the drawing and particularly to FIG. 1, the electrical contact construction embodied in the present invention is illustrated and is generally indicated at 10. The contact construction 10 includes an elongated tubular body portion generally indicated at 12, the body portion 12 being formed with a forward section 14 and a rearward section 16 integrally joined to the forward portion. The body portion 12 is preferably made of a base metal such as brass, nickel, steel or stainless steel and has a relatively thin wall. Located interiorly of the tubular body portion 12 and extending the length thereof throughout the sections 14 and 16 is an inner layer 18 that is preferably formed of a precious metal such as is normally utilized in electrical connec-